

AMENDMENTS TO THE CLAIMS

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (currently amended) A method for manufacturing an optical fiber preform by MCVD comprising:

a depositing process for forming ~~a clad/core deposition layer~~ clad and core deposition layers on an inner wall of a quartz tube;

a collapsing process for collapsing the quartz tube on which the deposition ~~layer is~~ layers are formed by heating the quartz tube ~~at to a higher temperature~~ higher than a softening temperature of the deposition layers;

~~an etching/collapsing~~ etching and collapsing process for etching and collapsing the quartz tube at the same time by injecting ~~an~~ reaction gas for etching into the quartz tube together with heating the tube at a ~~higher~~ temperature higher than a ~~the~~ softening temperature ~~so that the inner diameter of until the tube is optimized~~ has an inner diameter within the range of 2 to 4 mm after the collapsing process and just before a following closing process; and

a closing process for forming an optical fiber preform without a hollow portion by heating the quartz tube ~~having the optimized inner diameter at a higher to a~~ temperature higher than a the softening temperature after the etching and collapsing process,

whereby an index dip ~~existing~~ occurring at a center of the optical fiber preform core is ~~minimized~~ decreased or eliminated.

2. (currently amended) The method for manufacturing an optical fiber preform according to claim 1,

wherein, in the ~~etching/collapsing process~~ etching and collapsing process, the reaction gas for etching is a mixture gas of an etching gas and oxygen, and a flow rate ratio of Θ_2 ~~the oxygen~~ to the etching gas is ~~2.5 to 30~~ between 2.5:1 and 20:1.

3. (currently amended) The method for manufacturing an optical fiber preform according to claim 2,

wherein a flow rate of O_2 the oxygen is within the range of 50 to 120 sccm, and a flow rate of the etching gas is within the range of 4 to 20 sccm.

4. (currently amended) The method for manufacturing an optical fiber preform according to claim 1,

wherein, in the ~~etching/collapsing process~~ etching and collapsing process, a collapse rate of the quartz tube is 0.5 to 3.0 mm²/min.

5. (currently amended) The method for manufacturing an optical fiber preform according to claim 1,

wherein, in the ~~etching/collapsing process~~ etching and collapsing process, the quartz tube is collapsed to have the inner diameter within the range of 2 to 4 mm.

6. (currently amended) The method for manufacturing an optical fiber preform according to claim 1,

wherein the ~~etching/collapsing process~~ etching and collapsing process is performed from a gas input portion to a gas output portion along a longitudinal direction of the quartz tube.

7. (currently amended) The method for manufacturing an optical fiber preform according to claim 1,

wherein, in the ~~etching/collapsing process~~ etching and collapsing process, a rotational velocity of the quartz tube is 15 to 30 rpm, a movement velocity of a heat source is 1 to 40 mm/min, and a surface temperature of the tube is 2000 to 2400°C.

8. (original) The method for manufacturing an optical fiber preform according to claim 1,

wherein the collapsing process is performed 1 to 4 times.

9. (original) The method for manufacturing an optical fiber preform according to claim 1,

wherein, in the collapsing process, an inner pressure of the quartz tube is kept in a positive pressure of 0 to 10 mmWC in order to make a multi-mode optical fiber preform.

10. (original) The method for manufacturing an optical fiber preform according to claim 1,

wherein, in the collapsing process, an inner pressure of the quartz tube is kept in a negative pressure in order to make a single-mode optical fiber preform.

11. (original) The method for manufacturing an optical fiber preform according to claim 1,

wherein the collapsing process is performed together with injecting O₂ or Cl₂ into the quartz tube.

12. (original) The method for manufacturing an optical fiber preform according to claim 11,

wherein a flow rate of O₂ or Cl₂ is 1.2 to 2.4 slpm.

13. (original) The method for manufacturing an optical fiber preform according to claim 1,

wherein the closing process is performed from a gas output portion to a gas input portion along a longitudinal direction of the quartz tube.

14. (original) The method for manufacturing an optical fiber preform according to claim 13,

wherein the closing process is performed together with injecting O₂ or Cl₂ into the quartz tube.